



ATTACHMENT A

REMARKS

First, with respect to the Office Action Summary where the box is checked that indicates the drawings “are objected to by the Examiner,” while it appears that no specific objections to the drawings have been raised, new formal drawings are submitted herewith.

Considering the other matters raised in the Office Action in the same order as raised, claims 1-17 have been rejected under 35 USC 112, second paragraph, as being “indefinite.”

Considering the specific matters raised, the Examiner has objected to the phrase “a unique footprint” as being “a subjective term different in scope from a common or fully overlapping footprint.” Claims 1 and 11 have been amended to delete the reference to a “unique footprint” and to instead refer to a “common footprint or a common axis of symmetry” so as to better describe what is disclosed and is being claimed.

In the second specific objection, the Examiner has questioned the use of the phrase “a first sub-array of transducers disposed on a first surface of the piezoelectric member and a second sub-array of transducers disposed on a second surface of the piezoelectric member ...” The Examiner apparently considers sub-arrays of transducers as being physically complete, i.e., discrete, transducers that can be, for example, sandwiched together. In contrast, the applicant here considers a sub-array of transducers to be any acoustic aperture provided by opposing front and rear electrode patterns. In claims 1 and 11, the term “sub-array” is used to designate the acoustic apertures that are formed by selecting particular electrode patterns. This appears to be consistent with, for example, the terminology used in the Friemel et al patent. However, in order to expedite the prosecution, the claims have now been amended to refer to first and second sub-arrays of transducer electrodes, rather than transducers, so as to address the issue raised by the Examiner.

Finally, claim 7 has been objected to because “insofar as it describes a rotational relationship between the second bi-plane array and itself [it] is vague and indefinite.” An obvious clerical error is involved here and this error has been corrected.

Claim 1 has been rejected under 35 USC 102(b), or under 35 USC 102(e) in the case of two of the cited references, as being “anticipated by” the Shaulov ‘293 patent, the Shaulov ‘867 patent, the t’Hoen patent, the Hashimoto et al patent, the Slayton et al patent, the Smith et al

patent and the Friemel et al patent. Claim 1 has been amended so as to patentably distinguish over these references.

Considering the latter point in more detail, claim 1 has been amended to recite “first and second flexible interconnection circuits for providing electrical interconnections to the first and second sub-arrays wherein at least one of said interconnection circuits is folded such that the first and second interconnection circuits extend in a common direction.” Although the invention is, of course, not limited to the specific embodiment illustrated, this feature of the invention is illustrated in Figures 6(a) and 6(b). It is respectfully submitted that this feature is simply not disclosed in, nor suggested by, any of the references cited or relied on, and thus it is not necessary to discuss these references in any detail.

Claim 1, 8 and 11 have been rejected under 35 USC 103(a) as being “unpatentable over” the Hossack et al ‘473 patent “in view of the Hossack et al ‘835 patent and “further in view of either Shaulov (IEEE Symp. 1988) or Hashimoto et al.” This rejection is respectfully traversed, particularly as applied to claim 11.

Regarding independent claim 1, amended claim 1 distinguishes over the references relied on in this rejection for at least the reasons set forth above in discussing the other cited references.

With respect to independent claim 11, the Examiner has made reference to Figures 23-26 of the Hossack ‘473 patent. However, it is noted that the crossed elements 104 at both ends of the transducer 100 and 23 (and shown at different positions in Figures 24 and 25) are of a matrix arrangement and thus cannot be considered to be “bi-planar array portions” as suggested by the Examiner. Further, there seems to be some confusion between the terminology “bi-plane transducer” as used by Acuson as the commercial designation for a double phased TEE probe identified as V510B, and the bi-plane transducer of the present invention wherein the bi-plane transducer arrays have a common footprint or a common axis of symmetry. The Acuson V510B comprises two separate phased arrays rotated by 90° with respect to one another and aligned with the longitudinal axis of the probe. It is respectfully submitted that claim 11, as amended, patentably defines over the combination of references on which the Examiner relies, assuming, arguendo, that the combination is a proper one.

With respect to the rejection of the claims which depend on claim 1, these claims are patentable for at least the reasons set forth above in support of the patentability of claim 1. However, with respect to claim 3, the Slayton patent merely discloses intersecting array

transducers that are curved so as to conform to the shape of the transducer tip as shown in Figure 1(a). In contrast, the curvature of the bi-plane transducer claimed in claims 3 and 4 provides geometrical focusing of the bi-plane transducer so as to improve the output characteristic pattern by decreasing time delays between the transducer elements and avoiding the production of side lobes. Claim 3 has been amended to bring out this distinction more clearly.

Regarding claim 5, claim 5 has been rewritten in independent form as new claim 19 and is believed to be separately patentable. Claim 5 is directed to an ultrasonic bi-plane imaging probe wherein the acoustic axis of the transducer is aligned with the longitudinal axis of the probe. Although, again, the invention is not limited to the specific embodiment shown, such an arrangement is shown in Figure 8(c) of the present application. It is respectfully submitted that this aspect of the invention is simply not disclosed in the Slayton et al patent and thus that claim 19 is patentable over that patent .

With respect to claim 13, this claim is patentable for at least the reasons set forth above in support of the patentability of claim 11. Of course, claims 12 and 14, which also depend from claim 11, have been indicated to be allowable.

Claims 15-17 have been canceled so as to expedite the prosecution.

A new claim 18 has been added which depends from claim 1 and recites a further feature of the interconnection circuits.

Finally, allowable claim 7 has been rewritten in independent form as new claim 20.

Allowance of the application in its present form is respectfully solicited.

END REMARKS